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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/821,640	03/29/2001	Guei-Yuan Lueh	42390P9758	5724

8791 7590 11/19/2004

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EXAMINER	
KANG, INSUN	

ART UNIT	PAPER NUMBER
2124	

DATE MAILED: 11/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/821,640	LUEH ET AL.	
	Examiner	Art Unit	
	Insun Kang	2124	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 July 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed 7/26/2004.

2. As per applicant's request, claims 1-24 have been amended and claims 25-28 have been added. Claims 1-28 are pending in the application.

Specification

3. The objection to the abstract has been withdrawn due to the amendment to the Specification.

Claim Objections

4. Claims 1-28 are objected to because of the following informalities:

Per claims 7, 15, and 23, there appears to be an error in the claims, line 4: the colon is not used as originally recited in the context of "comprises: determining" in the amendment. Per claims 17 and 28, after "having" in line 9 of claim 17 and "including" in line 3 of claim 28, a colon is missing. Per claims 1, 4, 8, 9, 12, 16, 17, 20, 24, 25, and 28, the spacing between words is not consistent (e.g. between "in response to" and "an invocation" in claim 1). As per claims 2, 3, 5, 6, 10, 11, 13, 14, 18, 19, 21, 22, 26, and 27, these claims are objected for dependency on the above objected parent claims 1, 9, 17, and 25. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The previous rejection to claims 5, 6, 13, 14, 21, and 22 has been withdrawn due to the amendment to the claims.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 25-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 25 recites the limitation "the data processing system" in line 4. There is insufficient antecedent basis for this limitation in the claim.

Per claims 26 and 28, it is unclear as to which byte code in line 2 and native code in line 2 of claim 26 they are referring. They are interpreted as "the byte code" and "the native code." Per claim 28, it is unclear as to which byte code in line 5 it is referring. It is interpreted as "the byte code."

As per claim 27, this claim is rejected for dependency on the above rejected parent claim.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Ogasawara (US Patent 6,671,877).

Per claim 1:

Ogasawara discloses:

- storing native code associated with a first method within a native code space ("JITed codes are managed in memory," col 1 lines 50-57; "generates and stores into a storage a code for recording a method call which is actually issued," col 3 lines 10-45);
- determining whether the native code space exceeds a threshold in response to an invocation of a second method ("if a memory request of a JIT compiler cannot be met in a certain thread," col 4 lines 8-21; col 1 lines 50-60; "utilizing ...execution time information a degree of how readily a nonactive method is called (an activity degree)," col 3 lines 52-65)
- reclaiming the native code ("A JITed code discarding policy is "to discard JITed codes that are not expected to be used immediately." It can be expected that a method of a low activity degree will not be called for awhile. If [JI]Ted codes of methods not called for awhile are discarded, the amount of free memory used by them should be available for a long time," col 4 lines 45-60) associated with the first method and compiling byte code into native code associated with the second method in response to the determination("an activity degree is allocated to all the

methods, A JIT compiler discards JITed codes whose activities are lower...and continues compilation," col 6 lines 64-67)

as claimed.

Per claim 2:

The rejection of claim 1 is incorporated, and further, Ogasawara discloses:

-reclaiming the native code associated with the first method in response to a determination that the native code space exceeds the threshold ("if a memory request of a JIT compiler cannot be met in a certain thread...based on such an activity degree, some or all of JITed codes of a nonactive method are discarded," col 4 lines 8-21; col 1 lines 50-60)

as claimed.

Per claim 3:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

-storing the native code associated with the second method within the native code space in response to the compilation("a second method which has a high possibility that the second method is actually called from a first method corresponding to a stack frame is specified and stored into a storage by using the calling map and information concerning method calls which are actually issued for the first method," col 3 lines 23-45)

as claimed.

Per claim 4:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

-invoking the first method following the reclamation and re-compiling ...in response to the invocation of the first method ("A JIT compiler discards JITed codes whose activities are lower, restarts thread execution, and continues compilation," col 6 lines 64-67; "discarding a code to be effectively selected, frequency of recompile of an identical method could successfully be lowered and compile overhead reduce," col 7 lines 45-50; abstract) as claimed.

Per claim 5:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

- compiling byte code into native code associated with the second method (col 4 lines 56-58; col 7 line 20) as claimed.

Per claim 6:

The rejection of claim 5 is incorporated, and further, Ogasawara discloses:

-compiling byte code into native code associated with the second method ("compilation by a JIT compiler," col 4 lines 56-58)

as claimed.

Per claim 7:

The rejection of claim 2 is incorporated, and further, Ogasawara discloses:

-determining whether the first method is active or inactive ("calculating an active degree of a method...is used to decide an activity degree of each method," col 4 lines 8-21; "A JITed code discarding policy is "to discard JITed codes that are not expected to be used immediately." It can be expected that a method of a low activity degree will not be called for a while," col 4 lines 45-53)

-reclaiming the native code associated with the first method in response to a determination that the first method is inactive (...based on such an activity degree, some or all of JITed codes of a nonactive method are discarded," col 4 lines 8-21)

as claimed.

Per claim 8:

The rejection of claim 7 is incorporated, and further, Ogasawara discloses:

-determining whether the first method is hot or cold in response to a determination that the first method is inactive("calculating an active degree of a method...is used to decide an activity degree of each method," col 4 lines 8-21; "A JITed code discarding policy is "to discard JITed codes that are not expected to be used immediately." It can be expected that a method of a low activity degree will not be called for a while," col 4 lines 45-53)

-reclaiming the native code associated with the first method in response to a determination that the first method is inactive comprises reclaiming the native code associated with the first method in response to a determination that the first method is

cold(...based on such an activity degree, some or all of JITed codes of a nonactive method are discarded," col 4 lines 8-21)

as claimed.

Per claims 9-16, they are the data processing system-readable medium versions of claims 1-8, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-8 above.

Per claims 17-24, they are the data processing system versions of claims 1-8, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-8 above.

Per claims 25-28, they are the apparatus versions of claims 1-3, respectively, and are rejected for the same reasons set forth in connection with the rejection of claims 1-3 above.

Response to Amendment

The amendment to the claims filed on 7/26/2004 does not comply with the requirements of 37 CFR 1.121(c) because:

Claim 25 is newly added, therefore, the underline on "couple with the processor, the memory" needs to be deleted. The new corrected amendment is required upon response to this office action.

Response to Arguments

10. Applicant's arguments filed 7/26/2004 have been fully considered but they are not persuasive.

Per claim 1:

The Applicant states that:

Ogasawara does not teach or reasonably suggest determining whether the native code space exceeds a threshold in response to an invocation of a second method and reclaiming the native code. Instead, Ogasawara discloses calculating an activity degree of a method in order to determine when the method should be discarded (page 15).

In response to applicant's argument, the examiner points out that the calculating activity degree is performed "in order to effectively select a method for discarding a code (col. 3 lines 1-7). Both the instant invention and Ogasawara solve the memory limitation problem in JIT compilation by freeing memory based on a method invocation frequency as the solution for the memory limitation problem. Ogasawara clearly recites that if "a memory request of a JIT compiler cannot be met in a certain thread (col. 4 lines 8-22) and if "a memory limit is reached during compilation in step S401 the JIT compiler temporarily stops threads in operation in step S402 (col. 6 lines 13-15)." After that, step S403 is performed to select "JITed codes whose activities are lower (col. 6 lines 64-67)" and thereafter to release the memory occupied by them. Therefore, Ogasawara discloses the limitations in claim 1 and accordingly, the rejection of claim 1 is considered proper and maintained.

Per claims 9 and 17:

The applicant states that Ogasawara does not disclose the limitations of claims 9 and 17, for the reasons set forth in connection with claim 1. As shown above, the rejection of claim 1 by Ogasawara is considered proper and maintained, and accordingly, the rejections of claims 9 and 17 are also considered proper and maintained.

Per claim 25:

The applicant states that claim 25 is allowable for the reasons set forth in connection with claim 1. As shown above, the rejection of claim 1 by Ogasawara is considered proper and maintained, and accordingly, the rejection of claim 25 is also considered proper.

Per claims 26-28:

The applicant states that claims 26-28 are allowable as being dependent on allowable base claim. As has been shown above, the rejection of the independent claim 25 by Ogasawara is proper, the argument that claims 26-28 are allowable as being dependent on an allowable base claim is considered moot. Accordingly, the rejections of claims 26-28 are considered proper.

Conclusion

11. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Insun Kang whose telephone number is 571-272-3724. The examiner can normally be reached on M-F 9:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kakali Chaki can be reached on 571-272-3719. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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11/3/2004